



west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-3006A
Plant ID No.:	081-00259
Applicant:	CNX Gas Company (CNX)
Facility Name:	Rowland 310 Station
Location:	near Glen Daniels, Raleigh County
NAICS Code:	211111
Application Type:	Construction
Received Date:	October 21, 2013
Engineer Assigned:	Jill Harris, P.E.
Fee Amount:	\$2,000
Date Received:	October 28, 2013
Complete Date:	November 27, 2013
Due Date:	February 25, 2014
Applicant Ad Date:	November 11, 2013
Newspaper:	<i>The Register Herald</i>
UTM's:	Easting: 467.33 km Northing: 4,193.57 km Zone: 17
Description:	The facility is replacing their existing Ford CSG-649 compressor engine (60 bhp) with a Caterpillar G3304NA compressor engine (95 bhp), 4 stroke rich burn.

DESCRIPTION OF PROCESS

Rowland 310 Station draws incoming gas from Coal Bed Methane (CMB) wells at a suction of 4 psig. The inlet gas is then compressed in one stage to increase the pressure to 40 psig. The high pressure is then discharge out of the station through a pipeline, connected to a nearby gathering pipeline. The station will process 258,000 scf/day.

Incoming raw gas is split to feed the generator and the compressor skid. The generator provides power to the dewatering pump down in the gas well. The generator engine exhausts into the atmosphere. The compressor skid takes the raw gas to power the engine.

To control the new, proposed CAT G3304NA engine emissions, a catalytic converter and air fuel ratio controller (AFRC) had been installed. The catalytic converter is installed as a part of the exhaust system; therefore, all post combustion exhaust must pass through the catalyst element. There is no exhaust bypass around the catalytic converter. In addition, the catalytic converter/AFRC system includes measurement of exhaust oxygen levels and pre- and post-catalyst temperatures. If the AFRC drifts outside of its pre-determined range based on these measurements, the engine will be shutdown. The AFRC will then need to be reset before re-starting the engine.

SITE INSPECTION

John Money Penny from the DAQ's Compliance and Enforcement performed a site visit on February 20, 2013. The closest private residence was approximately 2 or 3 miles away. No odors or visible emissions were noticed during the inspection.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER (Modification Only)

Caterpillar G3304 Compressor Engine:

Potential emissions from the Caterpillar G3304 Compressor engine were calculated using manufacturer's emission factor, catalyst data, test data and AP-42 Emission Factors. Calculations are based on 7,640 Btu/bhp-hr natural gas consumed in the 95 bhp engine. Annual emissions from the engine are based on 8,760 hours per year.

Table 1: Caterpillar G3304 Compressor Engine PTE

Pollutant	Emission Factor (g/bhp-hr)	Hourly Emissions (lb/hr)	Annual Emissions (tpy)
Nitrogen Oxides (NOx)	0.5	0.105	0.458
Carbon Monoxide (CO)	1.0	0.209	0.917
Volatile Organic Compounds (VOC)	1.0	0.209	0.917
Sulfur Dioxide (SO2)	0.0019	0.0004	0.0017
Particulate Matter less than 10 microns (PM10)	0.06406	0.013	0.059
Formaldehyde	0.0677	0.014	0.062
Carbon Dioxide Equivalent (CO2e)	N/A	108	473

The following table represents the proposed annual increase in emissions at the facility.

Table 2: Proposed Increase & Decrease in Emissions

Pollutants	Permit Application R13-3006 Emissions	Permit Application R13- 3006A (tpy)	Change in Emissions / Facility PTE (tpy)
Nitrogen Oxides (NO _x)	9.23	3.96	(5.27)
Carbon Monoxide (CO)	25.84	17.40	(8.44)
Volatile Organic Compounds (VOC)	4.04	4.90	0.86
Sulfur Dioxide (SO ₂)	0.0017	0.0023	0.0006
Total Particulate Matter	0.06	0.08	0.02
PM10	0.06	0.08	0.02
Formaldehyde	0.07	0.09	0.02
Carbon Dioxide Equivalent (CO ₂ e)	361.15	610.61	249.5

REGULATORY APPLICABILITY

45CSR4 (To Prevent and Control the Discharge of Air Pollutants into the Open Air which Causes or Contributes to an Objectionable Odor or Odors)

This facility shall not cause the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public. 45CSR4 states that an objectionable odor is an odor that is deemed objectionable when in the opinion of a duly authorized representative of the Air Pollution Control Commission (Division of Air Quality), based upon their investigations and complaints, such odor is objectionable.

45CSR13 (Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation)

CNX has applied for a modification permit application. The facility published a Class I Legal Advertisement in *The Register Herald* on November 11, 2013. This agency will publish a Class I Legal Advertisement in *The Register Herald* to allow a 30 day comment period.

45CSR16 (Standards of Performance for New Stationary Sources)

The proposed Caterpillar G3304NA compressor engine is subject to 40 CFR 60 Subpart JJJJ and 40 CFR 60 Subpart OOOO.

45CSR22 (Air Quality Management Fee Program)

This facility is a minor source and not subject to 45CSR30. CNX is required to keep their Certificate to Operate current. CNX paid a \$1,000 construction application fee and a \$1,000 NSPS fee.

45CSR34 (Emission Standards for Hazardous Air Pollutants)

The proposed Caterpillar G3304NA compressor engine is subject to 40 CFR 63 Subpart ZZZZ.

40CFR60 Subpart JJJJ Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

The facility is proposing to install a 95 hp Caterpillar G3304 NA Compressor Engine. The engine was manufactured on May 10, 2007 and constructed in 2013.

The engine is subject to the requirements of §60.4230(a)(6), which states that owners and operators of stationary SI ICE that commence after June 12, 2006 are subject to the provisions of §60.4236.

Section §60.4236(a) states that owners and operators may not install stationary SI ICE with a maximum engine power of less than 500 HP that do not meet the applicable requirements in §60.4233.

Section §60.4233(d) states that owners and operators of stationary SI ICE with a maximum engine power greater than 25 HP and less than 100 HP must comply with the emission standards for field testing in 40CFR1048.101(c) for their non-emergency stationary SI ICE. The HC NO_x standard is 3.8 g/kW-hr (2.85 g/bhp-hr) and the CO standard is 6.5 g/kW-hr (4.88 g/bhp-hr). The Caterpillar engine has emissions of NO_x of 0.5 g/bhp-hr, CO of 1.0 g/bhp-hr and NMHC 1.0 g/bhp-hr. The HC NO_x is 1.5 g/bhp-hr for the engine (NMHC + NO_x emissions added). The engine is in compliance with this standard.

Section §60.4233(h) states owners and operators of stationary SI ICE that are required to meet standards that reference 40 CFR 1048.101 must, if testing their engines in use, meet the standards in that section applicable to field testing.

The facility is subject to the compliance requirements per section §60.4243(b). This section states that if you are an owner or operator of a stationary SI internal combustion engine and must comply with the emission standards specified in §60.4243(d), you must demonstrate compliance according to one of the methods specified in paragraphs (b)(1) and (2) of this section.

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Rowland 310

(1) Purchasing an engine certified according to procedures specified in this subpart, for the same model year and demonstrating compliance according to one of the methods specified in paragraph (a) of this section.

(2) Purchasing a non-certified engine and demonstrating compliance with the emission standards specified in §60.4233(d) or (e) and according to the requirements specified in §60.4244, as applicable, and according to paragraphs (b)(2)(i) and (ii) of this section.

(i) If you are an owner or operator of a stationary SI internal combustion engine greater than 25 HP and less than or equal to 500 HP, you must keep a maintenance plan and records of conducted maintenance and must, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. In addition, you must conduct an initial performance test to demonstrate compliance.

§60.4245(a) states that owners and operators of all stationary SI ICE must keep records of the information in paragraphs (a)(1) through (4) of this section.

(a) Owners and operators of all stationary SI ICE must keep records of the information in paragraphs (a)(1) through (4) of this section.

(1) All notifications submitted to comply with this subpart and all documentation supporting any notification.

(2) Maintenance conducted on the engine.

(3) If the stationary SI internal combustion engine is a certified engine, documentation from the manufacturer that the engine is certified to meet the emission standards and information as required in 40 CFR 90, 1048, 1054, and 1060, as applicable.

(4) If the stationary SI internal combustion engine is not a certified engine or is a certified engine operating in a non-certified manner and subject to §60.4243(a)(2), documentation that the engine meets the emission standards.

(d) Owners and operators of stationary SI ICE that are subject to performance testing must submit a copy of each performance test as conducted in §60.4244 within 60 days after the test has been completed.

The facility has on site a Ford LRG 425 32.5 RB4S engine. The engine was manufactured in 2006 and installed in 2008. The manufactures date is before 2008 and the construction date is before the applicable dates in §60.4236. Therefore, the engine is not subject to the requirements of this subpart.

40CFR60 Subpart OOOO Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution

The facility is planning on installing a 95 hp Caterpillar G3304 NA Compressor engine. The construction is planned for 2013. The provisions of this subpart apply to affected sources constructed after August 23, 2011. The Ford LRG 425 was installed before August 23, 2011 and is not subject to this subpart.

§60.5365(c) applies to each reciprocating compressor affected facility, which is a single reciprocating compressor located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment.

The facility will demonstrate compliance with the provisions in sections §60.5385 (standards), §60.5410 (initial compliance), §60.5415 (continuous compliance), §60.5420 (notification, reporting, recordkeeping).

There are no pneumatic controllers at the facility. The storage tanks were constructed in 2008 and are not subject to the requirements of this rule. In addition, the facility is not subject to the leak standards of this rule because the facility is not a natural gas processing plant.

40CFR63 Subpart ZZZZ National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

The facility is planning on installing a 95 hp Caterpillar G3304 NA Compressor engine. The construction is planned for 2013.

§63.6585(c) states you are subject to this subpart if you own and operate a stationary RICE at an area source of HAP emissions.

§63.6590(2)(iii) states a new stationary RICE is defined as a stationary RICE located at an area source of HAP emissions is new if you commenced construction of the stationary RICE on or after June 12, 2006.

§63.6590(c) states that stationary RICE subject to regulations under 40 CFR Part 60, that are new stationary RICE located at an area source (§60.6590(c)(1)) must meet the requirements of this part by meeting the requirements of 40 CFR part 60 subpart JJJJ, for spark engines. No further requirements apply for such engines under this part.

The facility currently has a Ford LRG 425 generator onsite. The source was constructed after June 12, 2006 and is considered a new engine. This engine was constructed in 2008 and manufactured pre-June 2006. As per a EPA Memo, dated 10/19/10, by Melanie King, Energy Strategies Group, Sector Policies and Programs Division, Office of Air Quality Planning and Standards:

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"...I am the [US EPA] quad J person, and yes - there are some engines that fall into a 'window' where they would not have any requirements under either NESHAP ZZZZ or NSPS JJJJ. Those engines that are 'New' under NESHAP ZZZZ (i.e. construction commenced \geq 06/12/06), located at an area source of HAP emissions, and ordered/manufactured before the applicable dates in NSPS JJJJ, do not have to meet any requirements in either rule."

The facility is not subject to the following rule.

45CSR30 (Requirements for Operating Permits)

The facility is a minor source of criteria pollutants and hazardous air pollutants. The facility is subject to 40 CFR 60 Subpart JJJJ and 40 CFR 60 Subpart OOOO and 40 CFR 63 Subpart ZZZZ. The facility is exempt from Title V permitting and is required to pay Rule 22 fees. See 45 CSR 22 in regulatory discussion.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

The following information was obtained from USEPA's Air Toxic Website.

Formaldehyde

Formaldehyde is used mainly to produce resins used in particleboard products and as an intermediate in the synthesis of other chemicals. Exposure to formaldehyde may occur by breathing contaminated indoor air, tobacco smoke, or ambient urban air. Acute (short-term) and chronic (long-term) inhalation exposure to formaldehyde in humans can result in respiratory symptoms, and eye, nose, and throat irritation. Limited human studies have reported an association between formaldehyde exposure and lung and nasopharyngeal cancer. Animal inhalation studies have reported an increased incidence of nasal squamous cell cancer. EPA considers formaldehyde a probable human carcinogen (Group B1).

AIR QUALITY IMPACT ANALYSIS

Based on the annual emission rates this facility will not be a major source as defined by 45CSR14, so air quality modeling was not performed.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates CNX's natural gas compressor station should meet all applicable requirements. It is recommended that CNX's proposed Rowland 310 Station should be granted a 45CSR13 construction permit for their facility.

Jill Harris, P.E.
Engineer

Date